

**Claims**

1. A method for providing Internet Protocol-type, or IP-type, mobility for a mobile station (MS) in packet radio network comprising:

at least one support node (GGSN, SGSN);

5 at least one support node being a gateway support node (GGSN) for interfacing with external networks (11), said gateway node supporting at least an IP-type protocol;

characterized by

10 integrating, into said at least one gateway support node (GGSN), a home agent (HA) for routing data packets to/from said mobile station;

supplementing said IP-type protocol with an extension for mobility management of said mobile station.

2. A method according to claim 1, characterized in that said gateway node comprises a protocol stack (18, 20) for supporting at least a  
15 layer 1 (L1) protocol, a layer 2 (L2) protocol, and a network layer (L3) protocol, and that said IP-type protocol resides on said network layer (L3); and said extension for mobility management is substantially a Mobile IP protocol.

3. A method according to claim 1 or 2, characterized by routing IP data packets to/from said integrated home agent/gateway node  
20 (GGSN+HA) using only the network layer (L3) protocol and the layer 2 and layer 1 protocols.

4. A method according to any one of claims 1 to 3, characterized in that the packet radio network comprises a foreign agent (FA) and a serving support node (SGSN), known per se, for supporting mobility management of the mobile station (MS); and that the foreign agent (FA) is integrated  
25 into at least one support node (SGSN, GGSN).

5. A method according to claim 4, characterized by integrating the foreign agent (FA) into at least one serving support node (SGSN).

6. A method according to claim 4, characterized by integrating the foreign agent (FA) into at least one gateway support node (GGSN).  
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7. A packet radio network for providing mobility service to a mobile station (MS), the packet radio network comprising at least one support node

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(GGSN, SGSN) wherein at least one support node is a gateway support node (GGSN) for interfacing with external networks (11), said gateway node supporting at least IP-type protocol;

- the packet radio network being characterized by an integrated network element (GGSN+HA) comprising the functions of the gateway support node (GGSN) and a home agent (HA) for routing data packets to/from the mobile station;

wherein said IP-type protocol comprises or is associated with an extension for mobility management of said mobile station.

8. A packet radio network according to claim 7, characterized in that the packet radio network comprises a foreign agent (FA) and a serving support node (SGSN), known per se, for supporting mobility management of the mobile station (MS); and that

- the foreign agent (FA) is integrated into at least one support node (SGSN, GGSN).

9. A packet radio network according to claim 7 or 8, characterized in that the foreign agent (FA) is integrated into at least one serving support node (SGSN).

10. A gateway support node (GGSN+HA) for a packet radio network, arranged to provide mobility service for a mobile station (MS), wherein the gateway support node (GGSN+HA):

is interoperable with at least one serving support node (SGSN), for routing data packets to/from the mobile station (MS);

supports at least IP-type protocol;

- the gateway support node being characterized by comprising the functions of the gateway support node (GGSN) and a home agent (HA) for routing data packets to/from the mobile station;

wherein said IP-type protocol comprises or is associated with an extension for mobility management of said mobile station.

11. Use of a gateway support node (GGSN) as a home agent (HA) for providing mobility service for a mobile station (MS) in a packet radio network, wherein the gateway support node supports at least an IP-type protocol, and said IP-type protocol comprises or is associated with an extension for mobility management of said mobile station.

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